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CLAIMS

1. A group discovery method for a plurality of devices equipped with respective microphones and electromagnetic communication subsystems, wherein:
- 5 - one said device, herein the initiator device, emits both a mating sound and, via its communications subsystem, a related mating signal,
- any other said device receiving the mating signal via its communications subsystem seeks to relate it with a sound, corresponding to the mating sound, picked up by its microphone,
- 10 a said other device receiving both the mating signal and related mating sound, herein an initial receiving device, thereby becoming at least a potential group member.
2. A method according to claim 1, wherein the mating signal includes a group identifier, each said initial receiving device determining itself to be a member of a group identified by
- 15 said group identifier.
3. A method according to claim 2, wherein each initial receiving device subsequently emits a connectivity-check sound and, via its communication subsystem, a related connectivity-check signal whereby to enable each group member to determine its sound
- 20 connectivity to other members of the group.
4. A method according to claim 1, wherein each said initial receiving device sends an acknowledgement back to the initiator device via its communications subsystem, the initiator device subsequently using the acknowledgements it receives to determine at least
- 25 an initial membership of the group.
5. A method according to claim 4, wherein the initiator device sends the initial membership via its communications subsystem to the member devices.
- 30 6. A method according to claim 1, wherein each said initial receiving device broadcasts an acknowledgement via its communications subsystem, the devices using the broadcast acknowledgements they receive to autonomously determine the membership of the group.

7. A method according to claim 5, wherein each initial receiving device that is a group member subsequently emits, at its own instigation, a connectivity-check sound and, via its communications means, a related connectivity-check signal, whereby to enable each member device to determine its sound connectivity to other member devices.

8. A method according to claim 6, wherein each initial receiving device that is a group member subsequently emits, at its own instigation, a connectivity-check sound and, via its communications means, a related connectivity-check signal, whereby to enable each member device to determine its sound connectivity to other member devices.

9. A method according to claim 4, wherein after determining group membership, the initiator device triggers, by means of trigger signals sent via its communication subsystem, each other group member to emit a connectivity-check sound whereby to enable each member device to determine its sound connectivity to other member devices.

10. A method according to claim 9, wherein each said trigger signal serves to indicate to member devices not being triggered to emit a connectivity-check sound by that signal, that a connectivity-check sound is to be emitted by a particular group member whereby to enable those members to judge when they have not heard an emitted connectivity-check sound.

11. A method according to claim 9, wherein each member device triggered to emit a connectivity-check sound also emits a connectivity-check signal via its communications subsystem whereby to enable other group members to judge when they have not heard an emitted connectivity-check sound.

12. A method according to claim 7, wherein each member device, other than the initiator device, sends, via its communications subsystem, confirmation and/or exception data, if any, about its sound connectivity in relation to other members as determined from the connectivity-check sounds it has received from other members; this data, where sent, being

sent to the initiator device for use in deriving a settled group membership that it communicates to the constituent members.

13. A method according to claim 9, wherein each member device, other than the initiator device, sends, via its communications subsystem, confirmation and/or exception data, if any, about its sound connectivity in relation to other members as determined from the connectivity-check sounds it has received from other members; this data, where sent, being sent to the initiator device for use in deriving a settled group membership that it communicates to the constituent members.

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14. A method according to claim 7, wherein each member device, other than the initiator device, sends, via its communications subsystem, confirmation and/or exception data, if any, about its sound connectivity in relation to other members as determined from the connectivity-check sounds it has received from other members; this data, where sent, being sent to the other member devices for individual use by each device to derive a settled group membership.

15. A method according to claim 8, wherein each member device, other than the initiator device, sends, via its communications subsystem, confirmation and/or exception data, if any, about its sound connectivity in relation to other members as determined from the connectivity-check sounds it has received from other members; this data, where sent, being sent to the other member devices for individual use by each device to derive a settled group membership.

16. A method according to claim 1, wherein the communications subsystem is one of an infrared communications subsystem, a short-range radio subsystem, and a cabled network subsystem.

17. A method according to claim 1, wherein the mating signal carries data indicative of at least one of the following:

- characteristics of the mating sound;
- contact details of the communications subsystem of the initiator device;

- a group identifier.

18. A method according to claim 1, wherein the mating sound and mating signal are related by at least one of:

- 5 - their general time of emission;
- corresponding characteristics;
- data carried by the mating signal indicative of at least one characteristic of the mating sound.

10 **19.** A method according to claim 1, wherein the initiator device is randomly determined from said plurality of devices.

20. A method according to claim 1, wherein the initiator device emits a said mating signal every n^{th} mating sound emitted, where n is an integer.

15 **21.** A method according to claim 1, wherein the initiator device emits said mating sound simultaneously with emitting the said related mating signal.

22. A method according to claim 1, wherein the initiator device emits said mating sound
20 later than the said related mating signal.

23. A group determination method for a plurality of voice-controlled devices equipped with respective microphones and electric or electromagnetic communication means, wherein a said device is caused to emit a sound at the same time as sending an electric or
25 electromagnetic signal, any other said device receiving both the sound and the signal responding to the emitting device to indicate its presence and being thereby included as a member of a group also including the emitting device.

24. Apparatus comprising:
30 - a sound emitter for emitting a mating sound;
 - an electromagnetic communications subsystem for sending and receiving signals; and

- a control subsystem for causing the sending of a mating sound using the sound emitter and a related mating signal using the communications subsystem.

25. Apparatus according to claim 24, further comprising means for including a group
5 identifier in the mating signal.

26. Apparatus according to claim 24, wherein the control subsystem includes group-
membership determining means responsive to receiving back acknowledgement signals,
via said communications subsystem, from entities that have received both the mating sound
10 and mating signal, to determine at least an initial group comprising at least selected ones of
those entities as members.

27. Apparatus according to claim 26, wherein the group-membership determining means is
operative to send the initial group membership via said communications subsystem to the
15 entities determined as members of said initial group.

27. Apparatus according to claim 26, further comprising trigger means operative,
following determination of group membership by the group-membership determining
means, to cause the sending of trigger signals, via said communication subsystem, to the
20 member entities of the group to trigger each such entity to emit a connectivity-check sound
whereby to enable each member entity to determine its sound connectivity to other member
entities.

29. Apparatus according to claim 28, wherein the group-membership determining means is
25 responsive to the receipt from entities of said at least initial group, via said
communications subsystem, of confirmation and/or exception data about the sound inter-
connectivity of these entities, to derive a settled group membership.

30. Apparatus according to claim 26, further comprising ranking means for ranking the
30 entities of the group for the purpose of setting an order of priority for transmission by
these entities.

31. Apparatus according to claim 24, wherein the communications subsystem is one of an infrared communications subsystem, a short-range radio subsystem, and a cabled network subsystem.
- 5 32. Apparatus according to claim 24, wherein the mating sound and mating signal are related by at least one of:
- their general time of emission;
 - corresponding characteristics;
 - data carried by the mating signal indicative of at least one characteristic of the mating
- 10 sound.
33. Apparatus according to claim 24, wherein the control subsystem is operative to send the mating sound at random intervals.
- 15 34. Apparatus according to claim 24, wherein the control subsystem is operative to control the sound emitter and communications subsystem such that said mating signal is only emitted every n^{th} mating sound emitted, where n is an integer.
35. Apparatus according to claim 24, wherein the control subsystem is operative to control
- 20 the sound emitter and communications subsystem such that said mating sound is emitted simultaneously with the said related mating signal.
36. Apparatus according to claim 24, wherein the control subsystem is operative to control the sound emitter and communications subsystem such that said mating sound is emitted
- 25 later than the said related mating signal.
37. Apparatus comprising:
- a sound receiver for receiving a mating sound;
 - an electromagnetic communications subsystem for sending and receiving signals; and
- 30 - a control subsystem operative upon the receipt of a mating signal via the communications subsystem and a corresponding mating sound via the sound receiver, to extract from the mating signal a group identifier.

38. Apparatus comprising:

- a sound receiver for receiving a mating sound;
- an electromagnetic communications subsystem for sending and receiving signals; and
- 5 - a control subsystem operative upon the receipt of a mating signal via the communications subsystem and a corresponding mating sound via the sound receiver, to send an acknowledgement via the communications subsystem identifying itself.

10 **39.** Apparatus according to claim 38, wherein the received mating signal includes a sender address, the control subsystem being operative to send the acknowledgement specifically to the sender address taken from the mating signal whereby to enable that sender to determine a group membership based on acknowledgements it receives..

15 **40.** Apparatus according to claim 39, further comprising a membership subsystem for receiving group membership data via said communications subsystem and for storing this data.

20 **41.** Apparatus according to claim 38, wherein the control subsystem is operative to broadcast the acknowledgement, the apparatus further comprising a membership subsystem for receiving , via said communications subsystem, acknowledgements from other apparatus and for determining from these acknowledgements, a group membership.

25 **42.** Apparatus according to claim 40, further comprising a sound emitter, and a connectivity-check arrangement; the connectivity-check arrangement being operative to emit a connectivity-check sound via said sound emitter and a related connectivity-check signal via its communications means; the connectivity-check arrangement being further operative to receive, via the sound receiver and communications subsystem, connectivity-check sounds and related connectivity-check signals from other apparatus and to use them

30 to check its sound connectivity with other apparatus in said group membership.

43. Apparatus according to claim 41, further comprising a sound emitter, and a connectivity-check arrangement; the connectivity-check arrangement being operative to emit a connectivity-check sound via said sound emitter and a related connectivity-check signal via its communications means; the connectivity-check arrangement being further
- 5 operative to receive, via the sound receiver and communications subsystem, connectivity-check sounds and related connectivity-check signals from other apparatus and to use them to check its sound connectivity with other apparatus in said group membership.
44. Apparatus according to claim 39, further comprising a sound emitter, and a
- 10 connectivity-check arrangement; the connectivity-check arrangement being responsive to a trigger signal received by its communications subsystem to emit a connectivity-check sound via said sound emitter; the connectivity-check arrangement being further operative to receive, via the sound receiver and communications subsystem, connectivity-check sounds and related data signals and to use them to check its sound connectivity with other
- 15 apparatus in said group membership.
45. Apparatus according to claim 44, wherein said related data signals are trigger signals sent to other apparatus.
- 20 46. Apparatus according to claim 44, wherein the connectivity-check arrangement is operative to emit connectivity-check signal as well as said connectivity-check sound, said related data signals being connectivity-check signals emitted by other apparatus.
47. Apparatus according to claim 42, wherein the connectivity-check arrangement is
- 25 operative to send, via said communications subsystem, confirmation and/or exception data, if any, about its sound connectivity in relation to other group members; this data, where sent, being sent to said sender whereby to enable the latter to derive a settled group membership.
- 30 48. Apparatus according to claim 44, wherein the connectivity-check arrangement is operative to send, via said communications subsystem, confirmation and/or exception data, if any, about its sound connectivity in relation to other group members; this data, where

sent, being sent to said sender whereby to enable the latter to derive a settled group membership.

49. Apparatus according to claim 42, wherein the connectivity-check arrangement is operative to send, via said communications subsystem, confirmation and/or exception data, if any, about its sound connectivity in relation to other group members; this data, where sent, being sent to the other member devices for individual use by each device to derive a settled group membership.

50. Apparatus according to claim 43, wherein the connectivity-check arrangement is operative to send, via said communications subsystem, confirmation and/or exception data, if any, about its sound connectivity in relation to other group members; this data, where sent, being sent to the other member devices for individual use by each device to derive a settled group membership.

51. Apparatus according to claim 38, wherein the communications subsystem is one of an infrared communications subsystem, a short-range radio subsystem, and a cabled network subsystem.

52. Apparatus according to claim 38, wherein the mating sound and mating signal are related by at least one of:

- their general time of emission;
- corresponding characteristics;
- data carried by the mating signal indicative of at least one characteristic of the mating sound.

53. Apparatus comprising:

- a sound emitter for emitting a mating sound;
- a sound receiver for receiving a mating sound;
- an electromagnetic communications subsystem for sending and receiving signals;

- a first control arrangement for periodically causing the sending of a mating sound using the sound emitter and a related mating signal using the communications subsystem; and
 - a second control arrangement operative upon the receipt of a mating signal via the communications subsystem and a corresponding mating sound via the sound receiver, to send an acknowledgement via the communication subsystem identifying itself;
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the second control arrangement being further operative, upon receipt of a mating signal and corresponding mating sound, to at least temporarily inhibit the first control arrangement.

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